



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

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Graduate Program in Mathematics

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MODULE HANDBOOK
Doctoral in Mathematics

Module name:	Database Concepts in Financial Services (Basis Data Jasa Keuangan)
Module level, if applicable:	Doctor Program
Code, if applicable:	
Semester(s) in which the module is taught:	First Year
Person responsible for the module:	Chair of The Study Program
Lecturer(s):	Dr. Adhitya Ronnie Effendie, M.Sc
Language:	Bahasa Indonesia
Relation to curriculum:	Doctor Degree in Mathematics, Compulsary Courses
Credit points:	3
Type of teaching, contact hours:	3x50 minutes lectures, 3x50 minutes structured activities.
Workload:	<ul style="list-style-type: none"> • 3x50 minutes lectures, • 3x50 minutes structured activities, • 3x50 minutes individual study, • In 16 weeks per semester (including mid-term and final examinations). • Total: 144x50 minutes per semester.
Requirements according to the examination regulations:	NONE
Recommended prerequisites:	Before taking this course, the students must have a good understanding in basic computer programming
Module objectives/intended learning outcomes:	<p>On satisfying the requirements of this course, students will have the knowledge and skills to:</p> <p>CO-1: Students will comprehend relational data model and will be able to:</p> <ul style="list-style-type: none"> • Explain the concepts of relational data model and applicate in simple database system <p>CO-2: Students will understand main concepts associated with relational algebra as well as their applications</p> <ul style="list-style-type: none"> • Explain the concepts of relational algebra <p>CO-3: Students will understand key concepts Entity Relational (ER) diagram and Normalization principle</p> <ul style="list-style-type: none"> • Explain the concepts of Entity Relational (ER) diagram • Explain the concepts of Normalization
Content:	The basic concept of a database is a collection of records, or pieces of knowledge. A database has a structured explanation of the types of facts stored in it: this explanation is called a scheme. Schema describes the object that is represented by a database, and the relationship between these objects. There are many ways to organize a schema, or to model a database structure: this is known as a database model or data model. The model commonly used today is the relational model, which in layman's terms represents all information in the form of interconnected tables where each table consists of rows and columns (the actual definition uses mathematical terminology). In this model, relationships between tables are represented using the same values between tables. Other models such as the hierarchical model and the network model use a more explicit way to represent relationships between tables.

	<ul style="list-style-type: none"> • Relational data model • Relational algebra • Entity Relational (ER) diagram • Normalization 															
Study and examination requirements and forms of examination:	<p>The final mark will be weighted as follows:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Assessment methods (components, activities)</th> <th>Weight (percentage)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Formulation the originality of research problem</td> <td>25%</td> </tr> <tr> <td>2</td> <td>Formulation the theoretical framework</td> <td>25%</td> </tr> <tr> <td>3</td> <td>Formulation the conjecture and methodology</td> <td>20%</td> </tr> <tr> <td>4</td> <td>Presentation</td> <td>30%</td> </tr> </tbody> </table> <p>Final grade will be determined as follows:</p> <p>Grade Criteria</p> <p>A : $95 \leq \text{final mark} \leq 100$ A- : $90 \leq \text{final mark} < 95$ A/B : $85 \leq \text{final mark} < 90$ B+ : $78 \leq \text{final mark} < 85$ B : $70 \leq \text{final mark} < 78$ B- : $65 \leq \text{final mark} < 70$ B/C : $60 \leq \text{final mark} < 65$ C+ : $54 \leq \text{final mark} < 60$ C : $48 \leq \text{final mark} < 54$ C- : $40 \leq \text{final mark} < 48$ C/D : $35 \leq \text{final mark} < 40$ D+ : $30 \leq \text{final mark} < 35$ D : $25 \leq \text{final mark} < 30$ E : final mark < 25</p>	No	Assessment methods (components, activities)	Weight (percentage)	1	Formulation the originality of research problem	25%	2	Formulation the theoretical framework	25%	3	Formulation the conjecture and methodology	20%	4	Presentation	30%
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1	Formulation the originality of research problem	25%														
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4	Presentation	30%														
Media employed:	White/Black Board, LCD Projector, Laptop/Computer															
Reading List:	<p>The related references to the dissertation will be nominated as per the selected topic and content.</p> <p>General references:</p> <ol style="list-style-type: none"> 1. <i>Date, C. J. (2003). An Introduction to Database Systems (8th ed.). Pearson. ISBN 978-0321197849.</i> 															

Mapping of The COs and PLOs

	PLO – 1 S3 Mat	PLO – 2 S3 Mat	PLO – 3 S3 Mat	PLO – 4 S3 Mat	PLO – 5 S3 Mat	PLO – 6 S3 Mat
CO 1	√	√	√		√	√
CO 2	√	√	√		√	√
CO 3	√	√	√		√	√

Programme Learning Outcomes (PLO) Doctoral Programme in Mathematics

PLO-1	Attitude: Devote to God Almighty, uphold the humanity values, internalize academic values and ethics, responsible in working in the area of expertise independently.
PLO-2	Knowledge: Mastering philosophy of mathematics and one of the fields in mathematics (algebra, analysis, applied mathematics, statistics, computational mathematics, computational statistics).

PLO-3	:	<p>Knowledge:</p> <p>Able to think logically, analytically, inductively, deductively, and structured; having the ability to manage, lead, and develop research programs independently, and able to communicate the thoughts as well as his work to the scientific community and the general public.</p>
PLO-4	:	<p>Skill:</p> <p>Creating new concepts and / or new methods (original) in the field of mathematics that are recognized nationally and internationally.</p>
PLO-5	:	<p>Skill:</p> <p>Able to apply mathematics according to their field of expertise to solve problems including those that require a multidisciplinary, cross-disciplinary, or trans-disciplinary approach.</p>
PLO-6	:	<p><i>Life Long Learning:</i></p> <p>Having lifelong learning skills and adaptive to the development of science and technology, especially in fields related to Mathematics and its applications.</p>